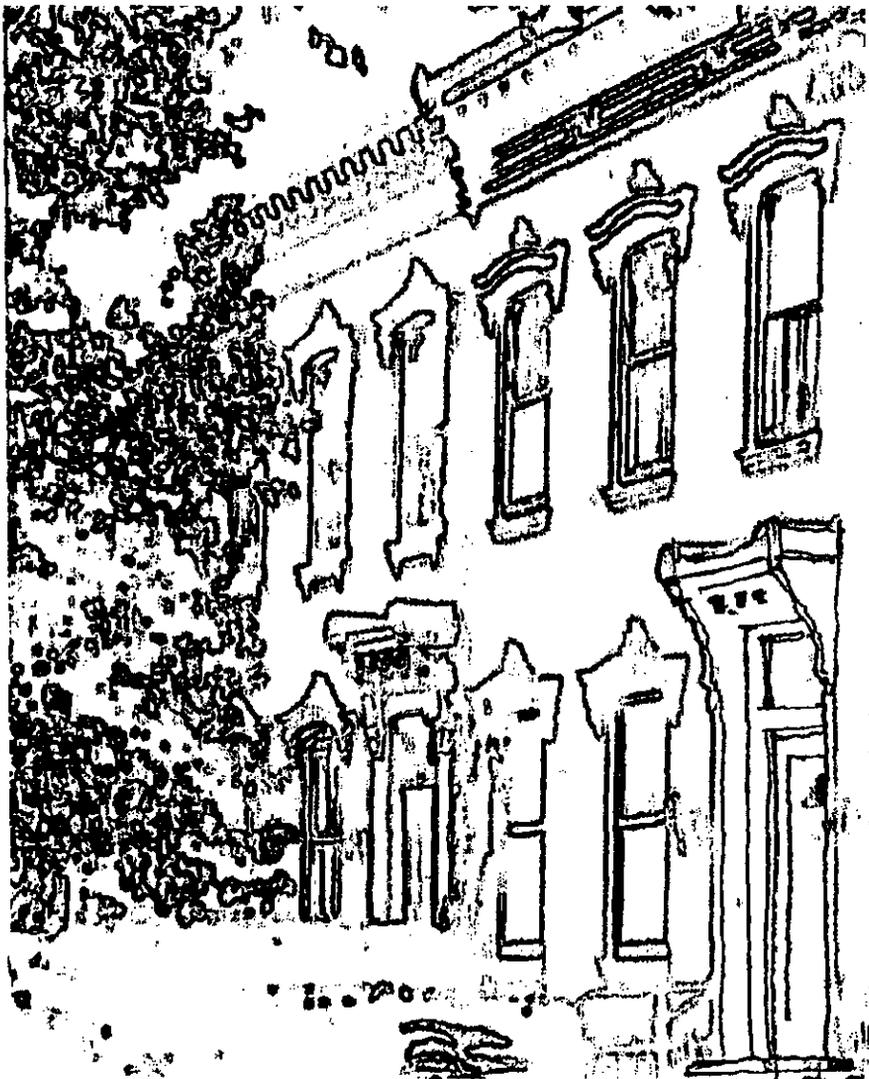


District of Columbia  
Historic Preservation Guidelines

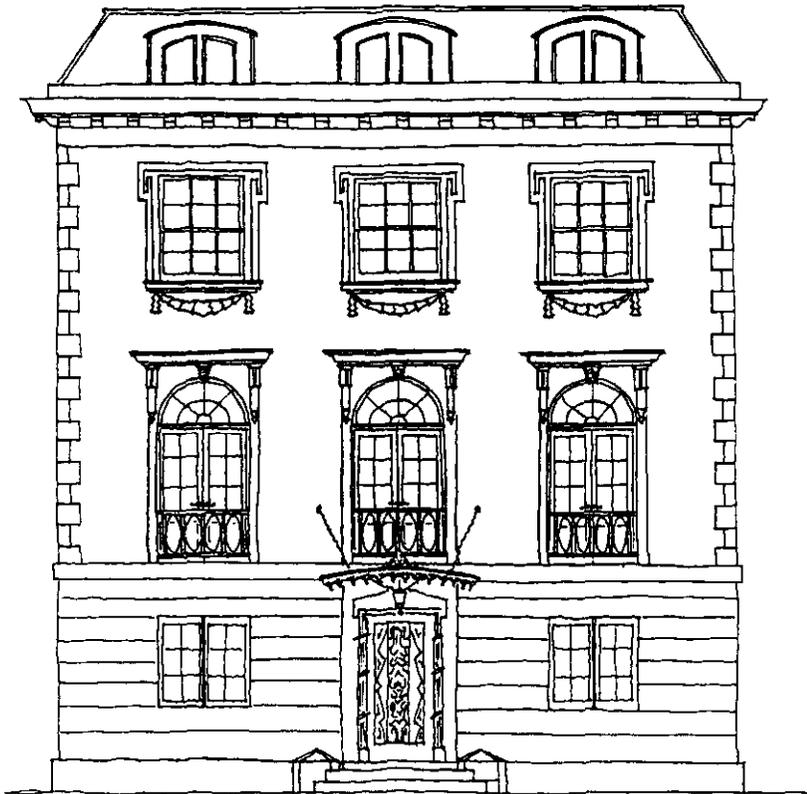
WINDOWS AND  
DOORS FOR  
HISTORIC BUILDINGS



# Introduction

The design, materials and location of windows and doors significantly contribute to the architectural character of historic buildings. Windows and doors located on the primary facade of residential, commercial, institutional and government buildings are almost always formally arranged in regular patterns. These patterns may be symmetrical, which is typically the case for classically styled buildings, or asymmetrical, which is the case for most Victorian era rowhouses. Windows and doors located on secondary, or side and rear, elevations of buildings may be formally or informally arranged.

The design, details and ornamentation of windows and doors also differ due to their location and function. Windows located on front facades may contain surrounds featuring a high degree of detail and ornamentation while those found on other elevations will usually be less ornate in design. Some window sash located on front facades contains etched, colored or stained glass, while sash located on side and rear facades almost always uses clear glass. Similarly, main entry doors which are almost always located on front facades tend to be more elaborate than side or rear doors.

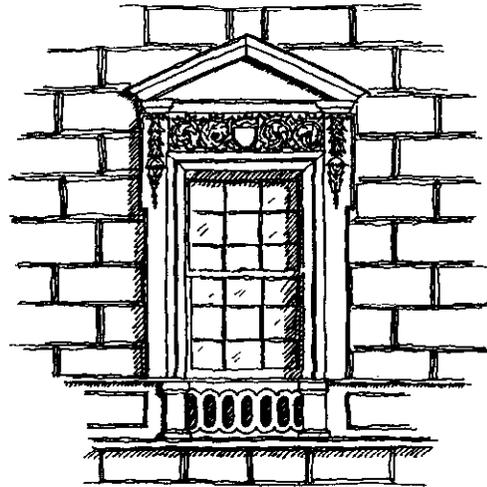


Both symmetrical and asymmetrical arrangements of windows and doors are found on different types of historic buildings.

# Design of Windows

Windows are constructed of a number of components. Windows and their frames are placed in window openings. The top horizontal structural framing member is called a lintel, if made of metal or stone, or header if made of wood or brick. The bottom horizontal member of a window opening is the sill. A window surround frames the window opening. Along with the type of sash used, the surround is almost always a character-defining element of a historic window.

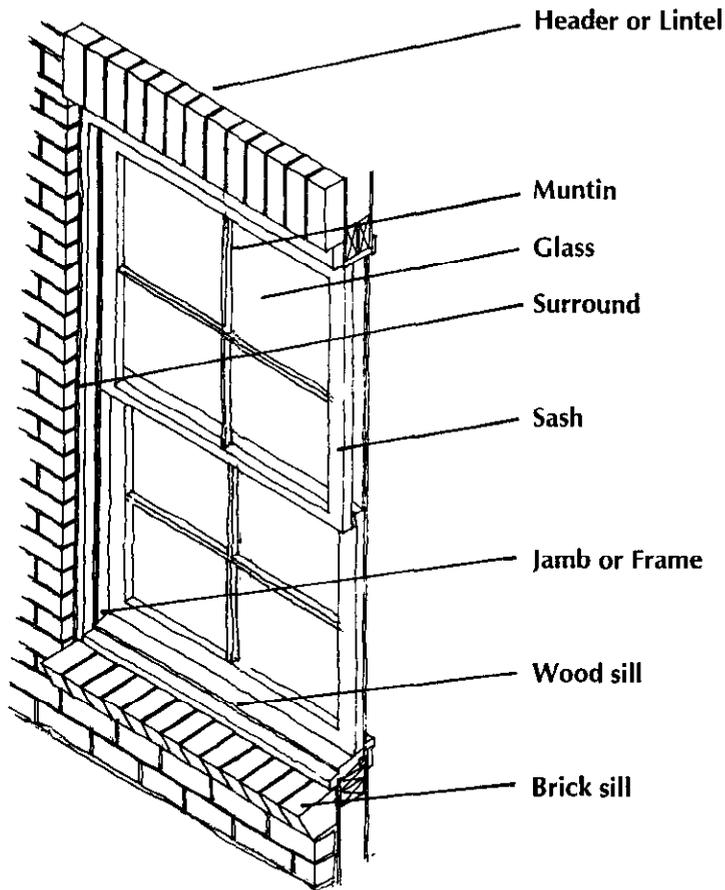
Until the mid-nineteenth century, surrounds on windows in residential buildings were almost always made of wood or brick. In the later part of the nineteenth century, elaborate surrounds of scrolled wood, pressed metal, patterned brick and rough cut stone were common. By the turn of the twentieth century, decorative window surrounds were commonly made of brick, stone and cast concrete. Window surrounds sometimes have decorative hoods covering the lintel or header. Usually non-structural, they are almost always character-defining. Similarly, the window sill is an important feature of a building's design. While usually not as elaborate as the hood, it gives visual prominence to the window.



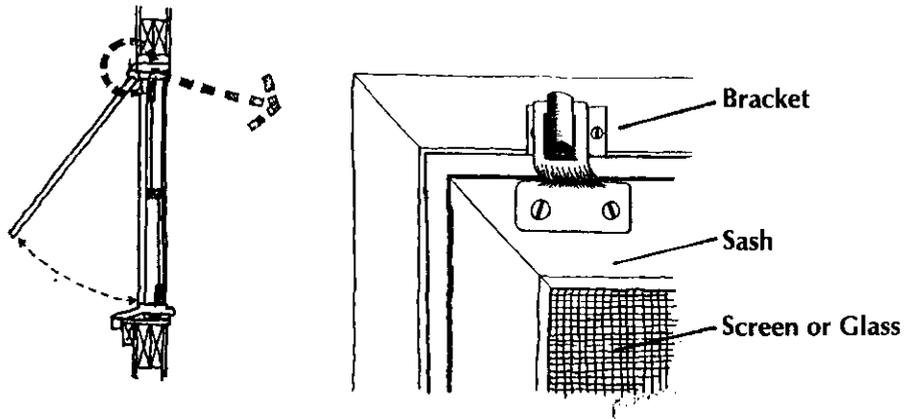
In the late nineteenth century, elaborate window surrounds were common on high style buildings.

The sides of a window frame are called jambs. The joint between the frame and the opening is sealed with a molding. The operable portion of a window is the sash. Windows are typically described by the number of sash and how they operate. For example, a window consisting of two sash which open and close vertically is called a double-hung window, while one consisting of three vertically moving sash is called a triple-hung window.

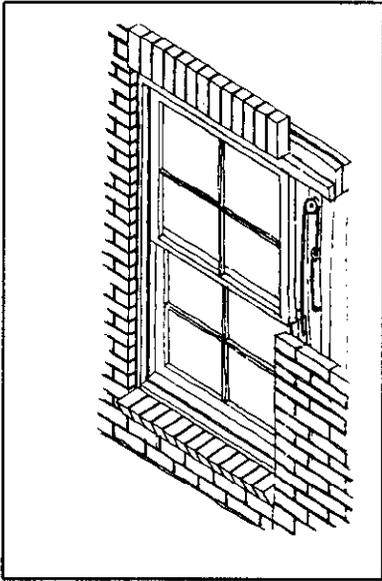
## Window Elements



The windows of many residential buildings, as well as some operable windows of commercial, institutional and government buildings, contain storm windows and screens. Historically made of wood, storm windows and screens were hung on brackets in front of the sash, fitting inside the jambs, head and sill. Historic storm windows and screens for double-hung windows are often divided horizontally at the meeting line of the sash, while those used on casement and other types of historic windows usually feature an undivided pane of glass.



Historic storm windows and screens were hung on brackets, fitting inside the jambs, head and sill.



Counterweights and sash cords allow historic double-hung windows to operate.

Also contributing to the design of windows is the hardware used to operate and secure the window. Historic hardware on double-hung windows consists of counterweights and sash cords hidden in pockets inside the jambs and locks usually located at the meeting rails between the sash. Casement, jalousie and awning window hardware primarily consist of blind hinges, exposed cranks and locks.

## Window Types

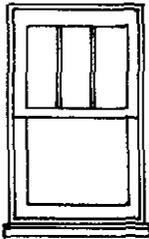
Many different types of windows are found on historic buildings. Their design was influenced by the technology available to make glass, sash and frame. Prior to the mid-nineteenth century, glass was manufactured by hand, limiting the size of individual panes. With the invention of machines to manufacture glass, the size of individual panes began to increase. Similarly, until steel could be manufactured inexpensively and in large quantities, window frames and sash were almost always made of wood.

### *Double-hung Windows*

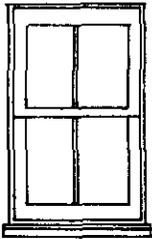
A double-hung window is the most common type found on historic residential buildings. Its two operable sash give the window its name. Most historic double-hung windows are made of wood, although historic steel double-hung windows may also be found. Variants of this type of window include single-hung (two sash with only one, usually the lower, being operable), and triple-hung (consisting of three operable sash).

The number of panes of glass or lights in each sash contributes to the appearance of the window. They also contribute to the name of the window. For example, a double-hung window consisting of a single pane of glass in the bottom sash and a single pane in the top sash is called a one-over-one window. A window with six panes of glass in the upper sash and one pane in the lower is called a six-over-one window. In some cases, the name given to a window type is also influenced by the type of glass used or shape of the header.

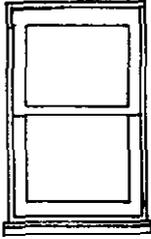
# Types of Double-Hung Windows



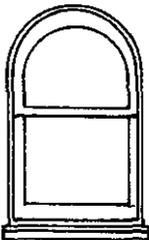
Three-over-one



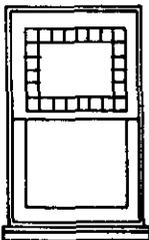
Two-over-two



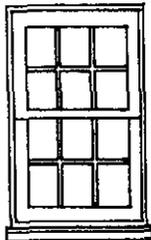
One-over-one



One-over-one with half-round arch



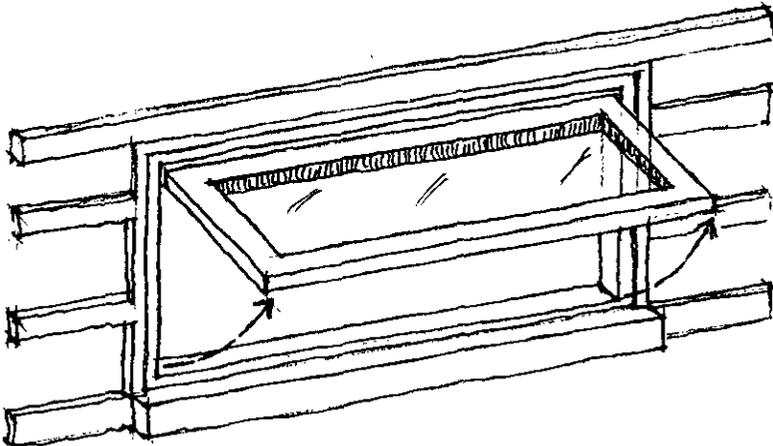
One-over-one with art glass



Six-over-six

# Awning Windows

Awning windows were introduced in the early twentieth century. An awning window consists of a pane of wide horizontal glass set in a wood or metal frame hinged at the top.

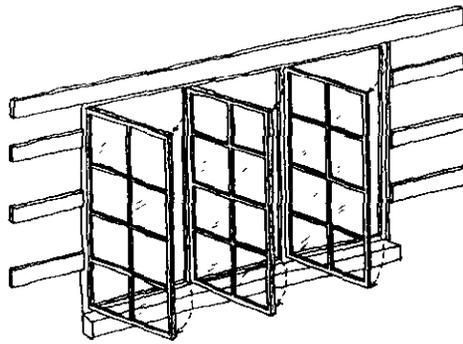


Awning Window

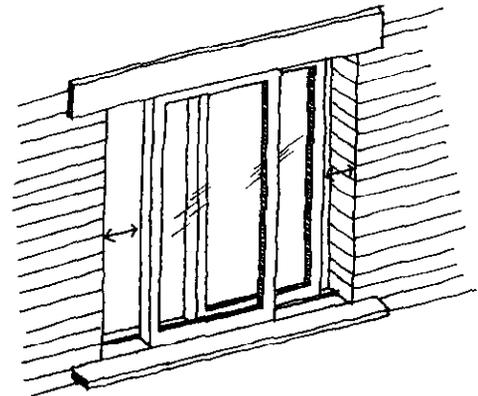
## ***Casement and Sliding Windows***

Casement and sliding windows are found on residential buildings constructed after 1900. Casement windows are mounted on vertical hinges and open outward, usually operated by a hand crank. They are found individually, in pairs, or as a row of multiple sash. The sash may be a single pane, or subdivided horizontally, vertically or in a multi-paned diamond pattern.

Although less common than other types of windows, original sliding windows can be found on historic buildings. Made of wood or metal sash, sliding windows typically consist of two sash that slide horizontally past each other. Each sash may contain a single piece of glass or be subdivided into multiple panes.



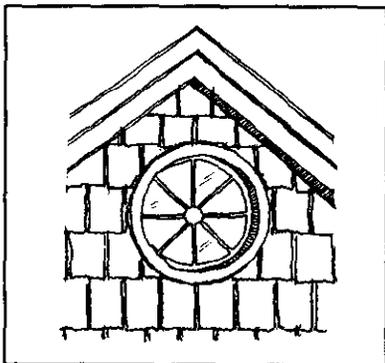
**Casement Window**



**Sliding Window**

## ***Decorative Windows***

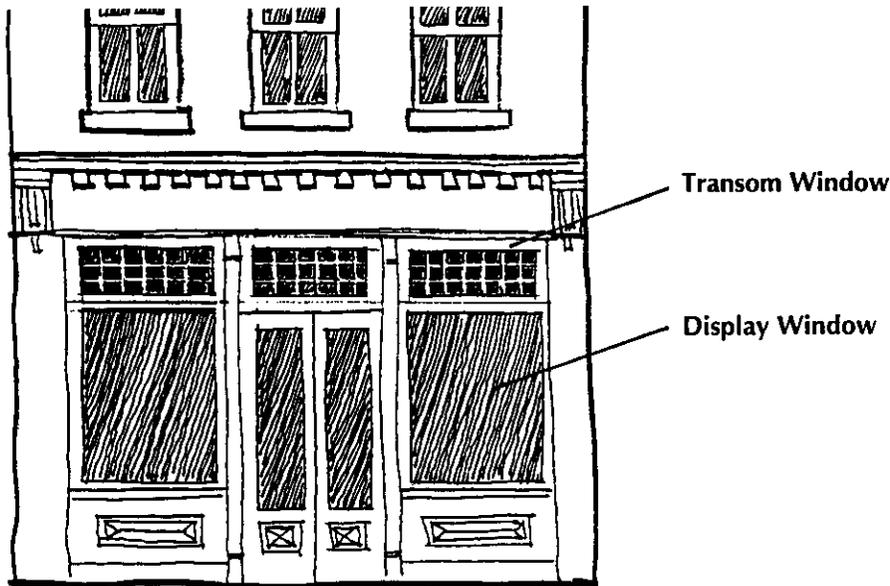
Different types of decorative windows are found on historic buildings. Their names are usually derived from the shape of the opening. For example, a bullseye window is round while an oval window is oval in shape. Bullseye windows are often located above main entries or in gable ends or dormers. They are typically made of wood with multiple panes separated by muntins in a pie-shaped pattern. Oval decorative windows, also made of wood and multiple panes of glass, are also found above main entries and sometimes adjacent to staircases. Other popular decorative window shapes include half-circular, quarter-circular and hexagonal. The glass used in decorative windows may be clear, colored, stained or of other types of specialty glass.



**Bullseye Window**

## Storefront Windows

Windows on storefronts of most historic commercial buildings consist of large panes of fixed glass, called display windows, as well as smaller transom windows located above entry doors and display windows. Display windows may be framed in wood, copper, bronze, aluminum or other metal. Transom windows may be set in lead or zinc frames, called comes. They may consist of a single sheet of glass or be subdivided into multiple panes of clear, colored, stained, prism or other types of specialty glass. Transom windows may be fixed or operable.(1)



Storefront Windows

## Altering Existing Windows

Changing the location, covering-up or changing the dimensions of a window opening is almost never appropriate since it alters the character of the existing window. On the other hand, adding a security system, shutters, air conditioning units, or awnings to existing windows may be appropriate if designed to be compatible with the building.

In some cases, original windows have been altered in the past. If the alteration is compatible with the character of the building or has achieved significance in its own right, it should be maintained. If not, the altered window should be replaced with one that is designed to be compatible with the original. The property owner should consult with the Historic Preservation Division to determine the significance of existing window alterations and the appropriateness of proposed changes.

1). For further information on storefront windows, see *Commercial Storefronts and Outdoor Seating Areas*.

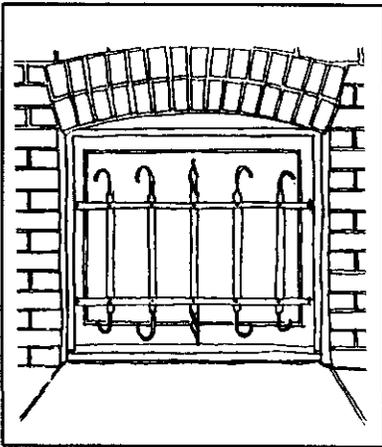
## ***Changing Window Locations***

The location of windows significantly contributes to the architectural character of elevations. In rowhouses and attached commercial buildings, window patterns contribute to the visual appearance of entire blocks. Thus, the location of windows is one of their most important character-defining features.

Altering the existing window pattern, either by changing their location or adding new windows to a facade, is strongly discouraged and should only be done after carefully considering the effect of the change on the overall character of a building and consultation with the Historic Preservation Division.

## ***Blocking-up or Covering-up Windows***

Blocking-up a window, that is, removing the sash and frame and filling in the opening, on a primary facade should never be considered since it will always significantly alter the original appearance of the wall. Blocking-up a window on a secondary facade may have less serious consequences on the overall character of a building, but still should only be considered if doing so does not dramatically alter the appearance of the elevation. Covering-up a window, that is, leaving the sash and frame intact but covering them with wood or other material, is reversible and thus somewhat better than blocking-up the window. However, covering-up a window will also alter the appearance of the facade and should be considered only after consultation with the Historic Preservation Division.



**Historic security bars are often character-defining elements of windows.**

## ***Adding Security Systems***

Some historic windows contain security bars that should be maintained, repaired or if missing, replaced. However, in most cases security systems are not original. While the need for security makes adding a security system to windows appropriate, the type of system selected should be compatible to the character of the window. For example, electronic security systems can often be added to existing windows without drastically altering their appearance. While security systems that features motion and sound detectors are preferred, systems utilizing electric strips attached to glass are acceptable. If the system has an exterior alarm or siren, it should be located so as not to detract from the appearance of the building, particularly the front facade.

Security bars are the most visually intrusive type of security system. If located outside the window, their design should be as simple as possible as well as be compatible with the design of the window and that of the facade. If located inside the window, their design is not as crucial, but should still complement that of the historic window.

Anchors used to attach security bars should not damage important historic materials or details. For example, if attached to masonry, anchors should be located in the mortar joints, not through the masonry units themselves. If anchored into wood, they should avoid any details or ornamentation. Anchors should never be located through metal surrounds. Security bars and other fixed security systems must meet the District of Columbia's building and fire codes.

## ***Adding Shutters***

Shutters may or may not be appropriate additions to historic buildings. Adding shutters depends on the use and architectural style of a building as well as documentation of their previous existence on the building. Typically, shutters are found on many large free-standing residences, on the fronts of some rowhouses and on some Colonial Revival buildings of the early twentieth century. Shutters may also be found on rear windows of most rowhouses. Shutters are almost never appropriate on commercial storefronts or on the front facade of rowhouses with bays. Historically, almost all shutters were operable. Made of wood slats, they completely covered the window opening when closed allowing air to circulate but preventing sunlight from entering.

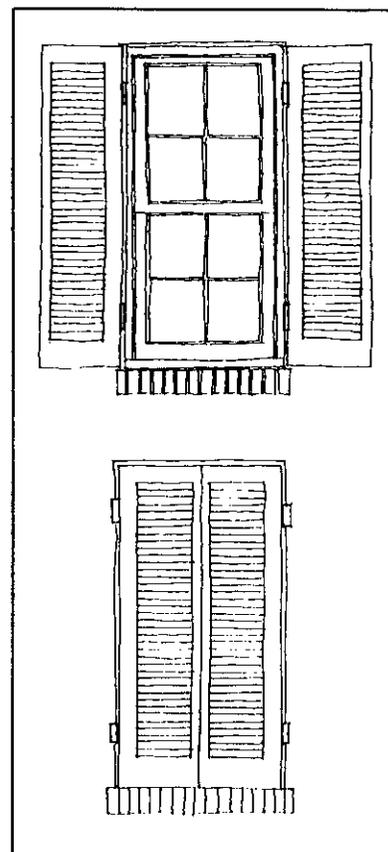
If historic shutters are missing or need to be replaced, existing shutters, photographic or other documentary evidence should be used to design the replacements. If adding new shutters is appropriate to the use and style of the building, they should be designed to be compatible with the size and design of the window. Even if the new shutters are inoperable, they should be sized to appear to cover the window when closed.

## ***Adding Window Air Conditioning Units***

Because window air conditioning units are temporary fixtures, adding them to historic windows does not require approval from the Historic Preservation Review Board. Nevertheless, property owners concerned with the appearance of their buildings should not add air conditioning units to windows on front facades, or to side and rear elevations visible from a public street. Window air conditioning units should always be removed during winter. Not only will this improve the appearance of the building, it will make the windows more thermally efficient. Air conditioning units should never be installed through an existing wall.

## ***Adding Awnings***

Awnings were historically used on certain types of buildings to protect windows from direct sunlight thus helping to keep interior rooms cool. Primarily found on commercial buildings



**New shutters should cover the window opening when closed. If the new shutters are not operable, they should be designed to appear to cover the opening.**

dating from 1870 to 1920, awnings were made of canvas attached to a fixed or retractable metal frame. Historic awnings may also be found on a few residences constructed during the same period.

Modern awning canvas typically has a 7 to 10 year life. When it becomes worn, it should be replaced in-kind or replaced with a modern matt-finished material. Awnings made of shiny vinyl or metal are almost never appropriate for historic buildings. The awning's color and detailing should complement the design of the building.

Adding awnings to an existing commerical building may be appropriate if designed to be compatible with a new or existing storefront. The awning frame should be designed to fit within the window opening. Its material, color and detailing should be compatible with the design of the building.(2)



Adding an awning to a historic commerical building may be appropriate if it is designed to be compatible with the storefront facade.

## Improving Thermal Efficiency of Windows

Building owners often wish to upgrade the thermal efficiency of historic windows. This can be done by adding weatherstripping, caulking or installing new storm windows. If the existing windows are so deteriorated that they must be replaced, the building owner should consider installing new thermal or insulated windows.

### *Weatherstripping and Caulking*

Historic weatherstripping is made from thin strips of copper, zinc or felt. Located between the sash and jambs it provides an almost air-tight seal. Modern weatherstripping is made from copper or aluminum. If historic weatherstripping worn or missing, modern weatherstripping should be installed.

2). For additional information on awnings, see *Commerical Storefronts and Outdoor Seating Areas*.

Modern caulking compounds have replaced historic tar-impregnated hemp as the sealant between the jambs, head and sill and the window opening. Applying new caulking can help improve the energy efficiency of a building. Building owners should carefully select caulking that is chemically compatible with the materials of the window and wall. The caulking should also be of a compatible color.

## ***Storm Windows***

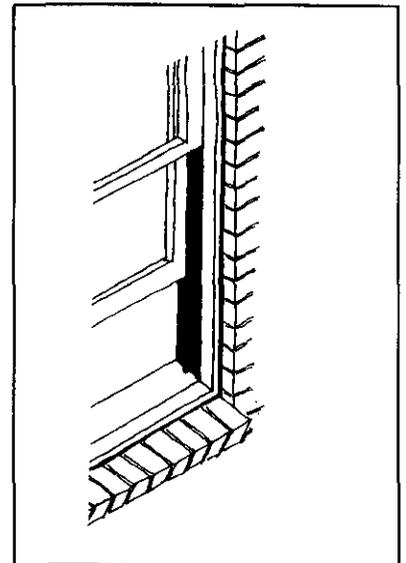
Unlike historic storm windows that must be removed and replaced with screens in the summer, modern storm windows consist of operable storms and screens. New exterior storm windows are usually made of aluminum, some with factory applied painted color or vinyl cladding. Sash and frame profiles matching the design of historic windows are often available. If not, they may be specially ordered from local suppliers.

The appearance of a new exterior storm window is critical to its compatibility with a historic window. Its design should match, as closely as possible, that of the historic window in size, profiles of sash and frame, and in other character-defining features. Clear, not tinted or reflective glass, should be used in new storm windows. Their frames should also match the color of the frame of the existing window.

An alternative to exterior storm windows are ones installed on the inside of the window sash. Since they are located inside the historic window, they may use a single, rather than multiple panes of glass and thus may be less expensive than exterior storm windows. The major disadvantages of internal storm windows are that they require modifying the historic window to prevent condensation from occurring and they may alter the depth of the interior window reveals. Both new internal or external storm windows should fit within the existing window opening. Blocking-down heads or blocking-in jambs to fit the opening to the storm window should never be done.

## ***Thermal Windows***

If existing historic windows are so badly deteriorated that they need to be replaced, the building owner should consider installing new thermal windows. New thermal windows should match the existing in number of lights, profiles, details and other defining characteristics. The glass used should have the same reflectivity as the original. Energy efficient clear E-glass is an acceptable substitute material and can be installed in existing frames. As an alternative, a second piece of glass may be added to some existing sash to create a thermally efficient window.(3)



**Weatherstripping and caulking is used to help make a window thermally efficient.**

3). For further information on improving the thermal efficiency of buildings, see ***Energy Conservation for Historic Buildings.***

# Maintaining and Repairing Windows

Window frames, sash and surrounds deteriorate due to rain, snow, insects, wind-borne grit and pollutants. In addition, window glass may become loose due to deteriorating putty, and window hardware may become worn and inoperable. Building owners should regularly inspect and maintain historic windows. Consideration should first be given to repairing only the deteriorated portions using in-kind materials, that is using the same type of materials as existing. Only if the deterioration is extensive, or parts of window are missing, should replacing the entire window be considered.

## Window Sash

Historic window sash is usually made of wood, although metal sash is found on some institutional, industrial and government buildings. Wood sash is subject to deterioration due to rot, usually caused by improper maintenance of paint, or due to insect infestation. Metal sash is subject to corrosion, also caused by improper maintenance of paint. Glass may become loose due to failure of the glazing putty.

Minor rot or insect damage can be repaired using an appropriate wood consolidant, such as epoxy, after the affected area has been properly prepared. More extensive damage, but not so severe as to warrant the replacement of the entire window, can be repaired by scabbing-in new sections of wood, sized and profiled to resemble the existing.<sup>(4)</sup>

Minor corrosion of metal sash can be repaired by cleaning the affected area with a wire brush and repainting. More extensive corrosion may require that the affected areas be removed and replaced. If this is necessary, it is important that the replacement metal be the same type as the original, so that the new and existing materials expand and contract at the same rate.

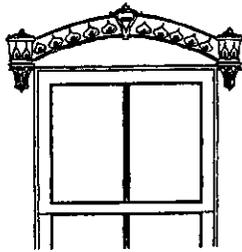
If the putty that seals the joint between the glass and the muntin is cracked or brittle it should be removed and replaced. The clips that hold the glass in place should be examined. If they are corroded or missing they should be replaced.

4). Scabbing-in is a method of repairing a portion of deteriorated wood by replacing it with new wood.

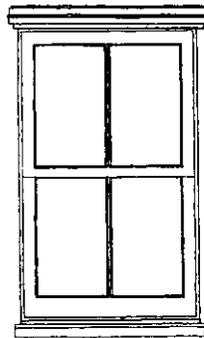
# Window Surrounds, Hoods, Lintels and Sills

Wood surrounds, hoods, lintels and sills may deteriorate due to rot, typically caused by improper maintenance of paint, or insect infestation. Masonry lintels and sills may be abraded by wind-borne grit or pollutants, or deteriorate due to mortar failure. Metal lintels hoods and sills may corrode or become detached due to failure of the anchoring systems.

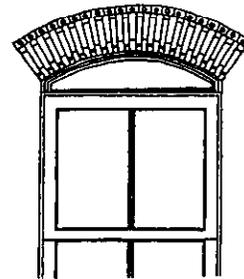
## Typical Window Hoods



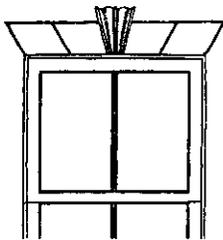
Cast iron hood molding



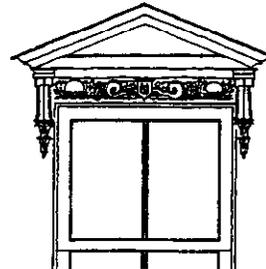
Wood hood molding and sill



Masonry pellet molding



Stone jack arch



Tin or zinc pedimented hood

A building owner should first determine if repairing only the deteriorated lintel, surrounds, hood or sill using the same material and design as the existing is technically and economically feasible. Only if the deterioration is too extensive for selective repair, should replacing the entire surrounds, hood, lintel or sill in-kind be considered. In both cases, it is important that the repair or replacement be profiled and detailed to match the existing so that the character of the window is preserved.

When surrounds, hoods, lintels or sills are missing they should be duplicated in the original material based on photographic or other documentary evidence. If replacing badly deteriorated or duplicating missing surrounds, hoods, lintels or sills in the same material and design proves not to be technically or economically feasible, then a substitute material may be used if designed and detailed to match the existing.

# Window Hardware

Sash cords, counterweights, cranks, hinges and locks may become worn or be missing. Typically, replacing the damaged or missing parts in-kind is the best maintenance solution. Fortunately, a number of specialty catalogs feature period window replacement hardware. In addition, some local hardware stores carry appropriately designed window hardware.

## Replacing Windows

If a window is beyond the point where it is technically or economically feasible to repair, replacing the window sash and surrounds may be the only option. Since windows are almost always an important character-defining feature of a building, special care must be taken when considering their replacement.

The first step should be to survey the building's windows. Are they all the same size, shape and light configuration, or are the windows on the front elevation different from those on the rear and sides? Do *all* the windows need to be replaced, or can some be repaired? Should the sash only be replaced, or are new frames needed as well? Are there any special windows, such as windows with colored glass or leaded comes or of an unusual shape that could not be easily replicated? In replacing windows it is important to identify and replicate the important characteristics which define the windows, such as their size, number of lights, profile, material and method of operation.

One particularly important feature of historic windows is the number and configuration of the lights. Until the mid-19th century, buildings typically had small windows with multiple panes of glass separated by heavy muntins. With technical advances in glass manufacturing, windows and window glass became larger and muntins became thinner. Thus, by the Victorian period, most new houses in Washington featured large, two-over-two or one-over-one windows. The trend continued until the turn of the twentieth century, when earlier Colonial and Classical architectural styles were revived and multiple-paned windows came back into fashion. When replacing a window, it is important to know if the existing windows are original, appropriate replacements or inappropriate replacements. For example, some historic houses have had their windows replaced with sash with an inappropriate number of lights, muntin profiles or type of glass. In these cases, new replacement windows should be designed to match the original windows and not the inappropriate existing windows. However, if the existing windows are original or appropriately designed replacements, they should be used as the basis for the design of new replacement windows. The Historic Preservation Division can help determine if the existing windows are original, appropriate replacements or inappropriate replacements.

Most modern window manufacturers offer a variety of window designs that are appropriate replacements but do not exactly duplicate the original. For example, it is not always necessary to have true divided lights in replacement windows. New windows that have muntins that are fixed to the sash and applied to the exterior of the window may be appropriate since they duplicate the appearance of true divided lights. However, windows that do not duplicate the true profile of the original, such as ones that use removable snap-on muntins or muntins placed between panes of insulated glass should not be used.

## Substitute Materials

If using the same material to replace a badly deteriorated window proves not to be technically or economically feasible, then the window may be replaced using a carefully considered substitute material. The design, profile, color, details, surrounds, number of lights and other character-defining features of the historic window should be matched as close as possible in the new material, particularly if the window is located on a primary elevation.

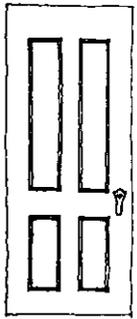
The following substitute materials may be appropriate for replacing historic windows. Before proceeding with a substitute material, building owners should consult with the Historic Preservation Division.

<u>Historic Material</u>	<u>Substitute Material</u>
Sash - Metal (Steel) Sash	- Aluminum
Glass - Clear	- Clear E-glass

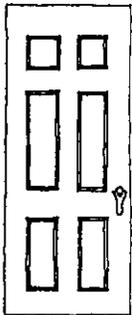
## Design of Doors

The location and appearance of doors are important character-defining features of historic buildings. Main entry doors, usually located on front facades, often employ richer materials and more elaborate designs than side, rear or service doors. In addition to allowing access into the building, main entry doors are typically designed to symbolically greet a guest or customer. For example, residential doors usually have a friendly, welcoming appearance while providing security and privacy. Commercial entry doors are also designed to make the customer or client feel welcome, while the main entry doors on government and institutional buildings are often formal and imposing.

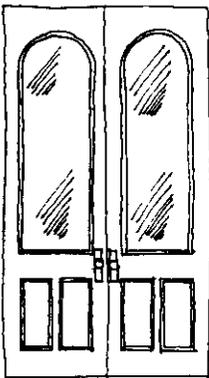
## Types of Residential Doors



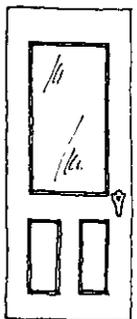
Four panel



Six panel



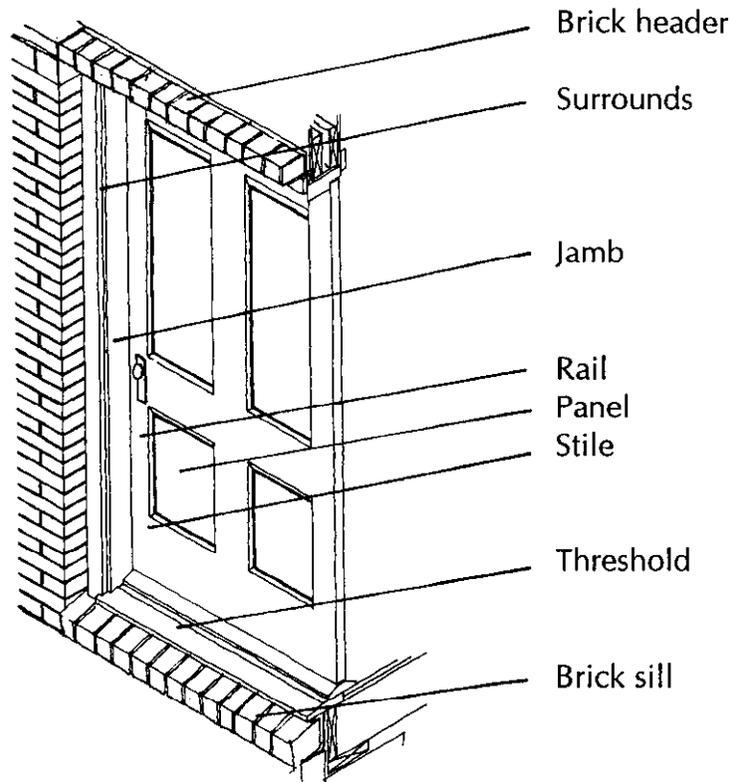
Double door with glass panels



Beveled glass panel

Doors have a number of components. The door opening is framed by jambs on both sides, a header at the top and a threshold at the base. Typically, the opening is framed by decorative surrounds. The operable portion of a door is called the leaf, which may contain a glass panel or solid panels, rails and stiles.

## Door elements



## Residential Doors

The most important door on historic residential buildings is the front door. Depending on the building's type and architectural style, the front door may be located symmetrically or asymmetrically in the front facade. Residential front doors usually contain a high level of detail and ornamentation. In addition to the front door, most residential buildings have a secondary door on the side or rear elevation. Typically, secondary doors are less elaborate than the front door.

Almost all historic residential front doors are made of wood with raised or recessed panels. Many nineteenth century doors had recessed panels enframed by raised molding. Today, most paneled doors contain recessed panels rather than raised moldings, making them appear much flatter. Some historic front doors incorporate plain, colored, stained, beveled or etched glass panels. Secondary residential doors are typically also made of wood, and may or may not contain raised or recessed panels.

# Storefront Doors

The main entry doors of commercial buildings are almost always constructed of a large pane of glass framed by wood or metal. Transom windows are often located above the door, allowing light into the building. Historically, transom windows were operable with some incorporating fans to assist ventilation.

Many main entry doors of commercial buildings are located in recessed entries. The recesses provide shelter from rain, snow and sun, and sometimes incorporated the name of the business or the building's street address in the floor.



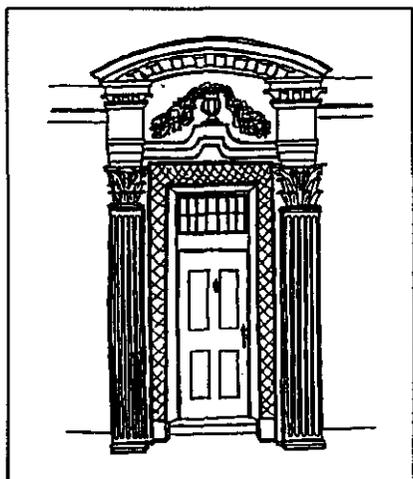
Main entry doors of commercial buildings are often recessed behind the facade to provide shade and protection from the weather.

# Doors on Institutional and Government Buildings

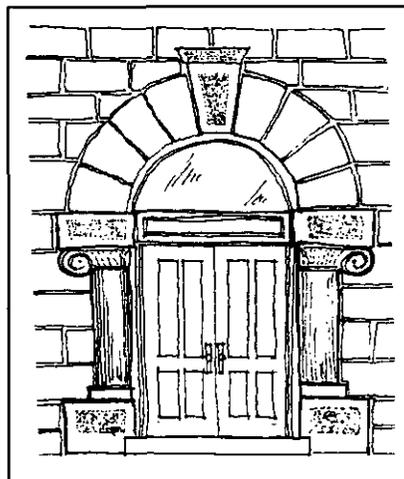
Historic main entry doors of institutional and government buildings are typically imposing in design with elaborate details and ornamentation. They may be constructed of wood, copper, bronze, aluminum or other metals, or incorporate decorative glass panels. In some cases, vestibule entries consisting of solid exterior and glass interior doors are used. During business hours, the solid doors are opened, inviting clients and customers inside. After business hours, the solid exterior doors are closed to provide security.

# Door Surrounds

Residential door surrounds are made of wood, brick or stone. Some door surrounds also contain metal hoods above the door. The surrounds of front doors are often more elaborate in detail and ornamentation than those found on secondary doors.



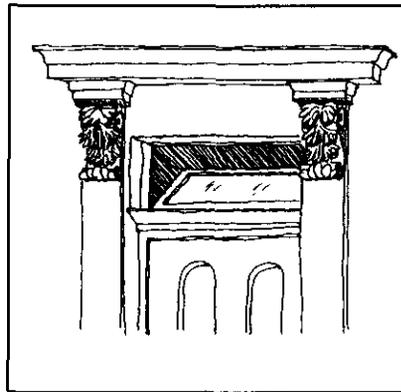
Wood surround



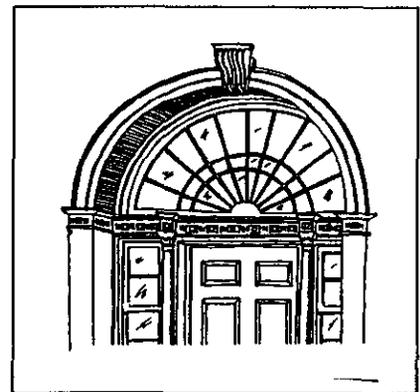
Stone surround

# Transoms, Side-lights and Fan-lights

Transom windows are located above doors. Typically found on rowhouses and commercial buildings, transom windows usually consist of single or multiple panes of clear glass. They may also contain colored, etched or stained glass in decorative patterns. Transom windows may be fixed or operable. Side-lights and fan-lights are windows on the sides and top of main entry doors. They are typically made of wood with the glass subdivided by muntins. Both are normally fixed, although operable fan-lights are found on a few buildings.



Transom window

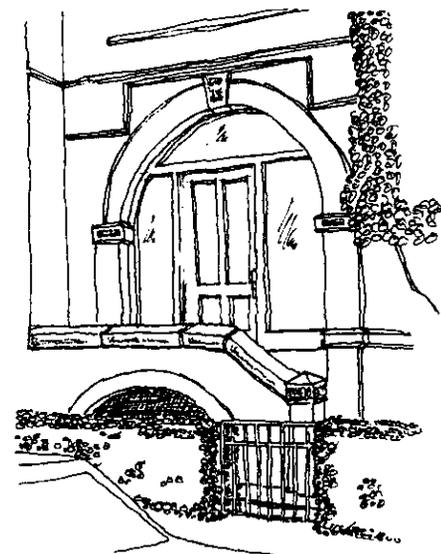


Fan-light and side-lights

## Vestibules

Rowhouses often contain an interior vestibule with exterior and interior doors. Vestibules help to improve thermal efficiency as well as provide additional security. While vestibules are primarily an interior feature and thus except for the exterior door are not subject to review by the Historic Preservation Review Board, their maintenance and appropriate repair or replacement should be of concern to the owner of a historic building.

Both exterior and interior vestibule doors contribute to the character of a building.



## Storm and Screen Doors

Historic storm and screen doors may be found on residential buildings in many of Washington's historic districts. Typically constructed of wood with interchangeable glazing and screen, their design and detailing should be compatible with the door.

## Altering Existing Doors

Historic doors that have been inappropriately altered should be replaced with a door that duplicates, as closely as possible, the design and detailing of the original. In cases where the alteration is compatible with the character of the existing door and the building, or is deemed to have achieved significance in its own right, it should be maintained. The property owner should consult the Historic Preservation Division to determine the appropriateness of door alterations.

## *Moving, Adding, and Blocking-up Doors*

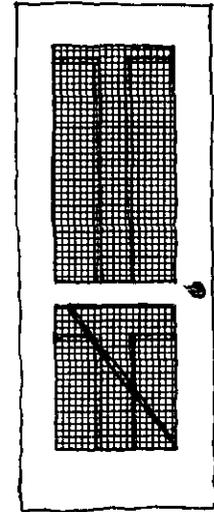
Moving or blocking-up existing doors, or adding a new door to a historic building will almost always change its character. If located on the primary facade, it is critical that the proposed alteration not significantly change the character of the facade. Moving, blocking-up or adding a door on a secondary facade may be less critical to the character of the building. However, altering doors on side and rear facades must be approached with care.

## *Security Systems*

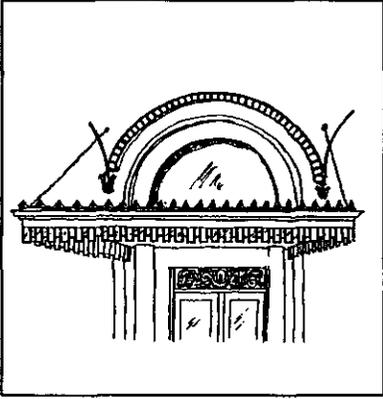
In some cases doors contain historic security grilles that should be maintained, repaired or, if missing, replaced. More often, new security doors are installed on historic buildings. Motion detection alarm systems are the preferred method of adding security because they do not detract from the appearance of a door. If security bars are used they should be as simple as possible, designed to complement features of the door and its surrounds, as well as fit within the door opening. If metal security doors must be installed, they should be designed, detailed and painted to resemble the original as well as fit within the existing opening.

## *Transom Air Conditioning Units*

Air conditioning units are sometimes installed in transom windows above commercial entry doors. While this is not the preferred solution to cooling a building, it is often the most economical. Transom window air conditioning units installed above recessed entry doors are less noticeable than those installed on non-recessed doors.



Storm and screen doors should be compatible with entry doors.



Historic entry canopies are often made of metal and glass.

## ***Entry Canopies***

Some apartment, commercial, government and institutional buildings have historic canopies of metal and glass or other materials above the main entry door. In other cases, a canvas entry canopy, attached to metal frames that sometimes extends over the sidewalk, has been added to a historic building.

If a historic canopy is badly deteriorated or missing, it should be repaired or replaced in-kind. If in-kind replacement proves not to be technically or economically feasible, a compatible new canopy in an appropriate substitute material is acceptable.

If a new canopy is to be added to a historic building where one did not previously exist, it should be designed to be compatible in scale, proportion, color, materials and other character-defining elements of the door. If the canopy extends beyond the property line, the building owner must obtain permission from the District of Columbia's Building Permit Division.

## ***Accessibility***

Sometimes historic doors must be modified to allow access for disabled persons or to meet requirements of the Americans with Disabilities Act. If this is necessary, building owners should consult with the Historic Preservation Division before proceeding.<sup>(5)</sup>

## **Improving Thermal Efficiency of Doors**

Building owners may wish to upgrade the thermal efficiency of historic doors. This can be done by weatherstripping, adding new storm doors or caulking. In addition, replacing worn sills may help to improve the thermal efficiency of a door.

## ***Weatherstripping***

Historically weatherstripping for wood doors was made from thin strips of copper or other metal attached to the jambs and head. When the door was closed, the strip provided an almost airtight barrier between the leaf, jambs and head. Modern weatherstripping for metal doors is made of neoprene or other synthetic material. If the existing weatherstripping is deteriorated or missing, it should be replaced in-kind. If the door is to be thermally upgraded, it may be possible to install new weatherstripping.

5). For further information on accessibility, see ***Accommodating Persons with Disabilities in Historic Buildings.***

## ***Storm Doors***

Adding a new storm door will also help to improve a building's thermal performance. If this option is considered, the building owner should make sure that the design, size, materials and color of the new storm door is compatible with the existing door and that clear glazing is used.

## ***Caulking***

In addition to weatherstripping and storm doors, caulking the joints between the door surrounds and opening will prevent air infiltration, thus upgrading the thermal efficiency of an existing door.

# **Maintaining and Repairing Doors**

Doors are subject to various forms of deterioration. Wood leafs, surrounds and frames, particularly the threshold and lower portions of the jambs, may rot or become infested with insects. Brick and stone surrounds may erode or their mortar joints may deteriorate. Metal doors and surrounds may corrode or their anchoring systems fail. Door hardware may no longer function properly. The putty or gaskets holding glazing in place may crack or become loose.

Building owners should regularly inspect and maintain their historic doors. When deterioration is first noticed, consideration should be given to repairing the door. If the deterioration is extensive, replacing the entire door in-kind should next be considered. Only after replacing in-kind has been determined not to be economically or technically feasible, should the building owner consider replacing the door in a substitute material.

## ***Doors, Frames and Surrounds***

Historic wood doors are subject to rot, usually caused by improper maintenance of paint, and to damage by insects. This is particularly true of wood thresholds and lower portions of wood surrounds. Minor rot or insect damage can often be repaired using an appropriate wood consolidant, such as epoxy, after the affected area has been properly prepared. More extensive damage may require scabbing-in wood patches, sized and profiled to match the existing.

The deterioration of metal doors is primarily caused by corrosion. Minor corrosion can be cleaned by sanding or brushing, while more extensive corrosion may require cleaning with chemical solvents. If painted, the cleaned area should be primed and repainted immediately. Before any action is taken the type of metal should be determined, particularly if chemical cleaning is considered. Some types of metal react adversely to certain cleaning chemicals; using the wrong one may accelerate deterioration rather than remove corrosion. Damage that is more extensive than minor corrosion may require patching the door with the same metal or in a compatible substitute material. Patches and replacements should be designed and detailed to match the design of the existing door.

## ***Door Hardware***

Door hardware consists of hinges, knobs, pulls, mail slots, door bells, bottom rail-plates and closures. Hardware may be worn or missing. Typically, it is better to replace rather than attempt to repair worn hardware. Fortunately, in the past few years, period door hardware has become readily available. Replacement hardware should be of the same or compatible metal and design as the original.

## **Replacing Doors**

When selective repair is not technically or economically feasible replacing the entire door may be the only option available to the building owner. If the door is original, replacing the unit in-kind should be considered first. The replacement should be designed to match the existing in size, profile, number of panels, depth of reveals and other character-defining features. This is particularly important for main entry doors. If using the same material to replace the original proves not to be technically or economically feasible, then the door may be replaced using a substitute material. It is important that the design and detail of the substitute material match that of the existing door. In addition, the new material should be chemically and physically compatible with surrounding materials.

If the original door was replaced with a door of inappropriate design, size, shape, profile or material, the building owner should consider replacing it with one of appropriate character. The design of the replacement should be compatible with the character of the building and fit within the size and shape of the original opening. If documentary or pictorial evidence of the original door exists, it should be used to design the replacement. In the case of rowhouses, commercial blocks or identical free-standing residences, historic doors from neighboring buildings may also be used as the basis for the design of the replacement door.

## Substitute Materials

The following substitute materials may be appropriate for replacing historic doors. Before proceeding with a substitute material, building owners should consult with the Historic Preservation Division, as well as the District of Columbia building codes regulations on door materials.

### Historic Material

### Substitute Material

- Wood surrounds

- Fiberglass

- Metal hoods

- Fiberglass

- Clear glass

- Clear E-glass

The *District of Columbia Historic Preservation Guidelines* were developed under a grant from the Historic Preservation Division, Department of Consumer and Regulatory Affairs, Government of the District of Columbia. They were funded in part by a grant from the United States Department of the Interior, National Park Service. The United States Department of the Interior prohibits discrimination on the basis of race, color, sex, national origin, or handicap. If you believe that you have been discriminated against in any program, activity or facility in this program, or if you desire further information please write to: Director, Office of Equal Opportunity, National Capital Region, National Park Service, U.S. Department of the Interior, 1100 Ohio Drive, S.W., Washington, D.C. 20242, (202) 619-7020. AN EQUAL OPPORTUNITY EMPLOYER M/F/H.